

## REMARKS

Initially, Applicant and Applicant's attorneys express appreciation to the Examiner for the courtesies extended during the recent in person interview held on August 23, 2006 with Applicant's representative. During the interview, proposed amendments to the independent claims were discussed, as well as the cited art and rejections of record, and the amendments and remarks submitted herein are consistent with the discussions during the interview.

The Office Action, mailed July 25, 2006, considered claims 1-61.<sup>1</sup> By this paper, claims 1, 5, 19, 23, 33, 39-59 and 61 have been amended, claims 4, 22 and 41 cancelled, and no claims added.<sup>2</sup> Accordingly, claims 1-3, 5-21, 23-40 and 42-61 remain pending for reconsideration, of which the only independent claims at issue are claims 1, 19, 33, 39, 52 and 58.

Claims 39-57 were rejected under 35 U.S.C. § 101 as being drawn to non-statutory subject matter. In light of the amendments above, however, Applicant respectfully submits that the claim rejections are now moot. In particular, claims 39-57 have been amended to recite physical computer readable storage media and, accordingly, are clearly directed toward statutory subject matter.<sup>3</sup>

In addition, and as discussed during the interview, claim 61 was rejected as lacking patentable utility and for failing to meet the written description requirement. Applicant respectfully submits that such rejections are overcome by the above amendments inasmuch as the claim now recites wherein the new video stream is output such that it has a width which is a multiple of sixteen and a height which is a multiple of thirty-two. Such a recitation is clearly supported by at least paragraph 39 of the original disclosure which notes, with respect to a new video stream, that "it is useful to ensure that the height and width of the images in the output video stream are multiples of 32 and 16, respectively."

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<sup>1</sup> Claim 61 was rejected under 35 U.S.C. § 112, first paragraph under the written description requirement. Claims 39-57 were rejected under 35 U.S.C. § 101 for purportedly being directed to non-statutory subject matter. Claims 1-11, 13-28, 30-35, 37-47, 49-54, 56-59, 60 and 61 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Panusophone et al. (U.S. Patent No. 6,647,061) in view of Cheney (U.S. Patent No. 6,519,283) (with Christopoulos (U.S. Publ. No. 2001/0047517) providing the motivation). Claims 12, 29, 36, 48 and 55 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Panusophone and Cheney, and further in view of Wee, "Secure Scalable Streaming Enabling Transcoding Without Decryption." Although the prior art status of the cited art is not being challenged at this time, Applicant reserves the right to challenge the prior art status of the cited art at any appropriate time, should it arise. Accordingly, any arguments and amendments made herein should not be construed as acquiescing to any prior art status of the cited art.

<sup>2</sup> Support for the amendments to the claims can be found throughout the original application, including, but not limited to, the disclosure found in paragraphs 8, 30, 31, 33, 39 and 42-45.

<sup>3</sup> Although the claims have been amended to recite a computer readable media rather than a computer program product, Applicant does not acquiesce to the assertion that the phrase "computer program product" is indefinite as lacking a set definition. Applicant submits that the phrase would be well understood by one of ordinary skill in the art and is within standard claim procedures accepted by the Office (as evidenced by the hundreds, if not thousands, of patents issued with claims directed towards "computer program products.")

As discussed during the interview, and as reflected in the above claim listing, the present invention is directed to methods, computer readable media, and devices for transcoding a video stream. As recited in claim 1, for example, a method for transcoding an incoming video stream to reduce the bit rate of the video stream is described. The method includes decoding the incoming video stream which includes at least one B frame as well as a plurality of macroblocks. Each macroblock has parameters that include at least a type flag indicating whether the macroblock is infra or non-infra. In addition, non-infra macroblocks have one or more associated motion vectors. Such parameters can be extracted from the incoming video stream and used in generating a new video stream. Further, images of the incoming video stream are reduced in horizontal and vertical size by a selected factor and in a manner that considers at least one B frame while spatially reducing the images. In addition, the plurality of macroblocks are mapped to at least one macroblock in the new video stream, and the macroblock type for each macroblock of the new video stream is determined. Such a determination is made by applying a weighted mean rounded value determined from the type flags of the macroblocks of the incoming video stream that map to a particular macroblock of the new video stream. Thereafter, the new video stream that includes the spatially reduced images is generated using parameters extracted from the incoming video stream and the macroblock type of the new video stream, and such that at least one parameter corresponds to a B frame and less than all parameters are re-computed for the new video stream.

Claims 19 and 33 generally correspond to the method of independent claim 1, but further recite, by way of example, resampling and generating new motion vectors. Independent claims 39 and 52 are directed to computer readable media for implementing methods generally corresponding to claims 19 and 33, and claim 58 is directed to a transponder for use in implementing the foregoing methods.

As clarified during the interview, while Panusophone and Christopoulos generally relate to transcoding data, they clearly fail to teach or suggest a method, computer readable media or transponder as claimed above. For example, among other things, the cited references fail to teach or suggest that for an incoming video stream that includes type flags and motion vectors for macroblocks, mapping each of a plurality of macroblocks to at least one macroblock in the new video stream and determining the macroblock type for each macroblock in the new video stream by applying a weighted mean rounded value determined from the type flags of macroblocks of the incoming video stream, as recited in combination with the other claim elements.

For example, and as discussed in the interview, Panusophone appears to discuss various calculations applied to motion vectors and DCT values, but fails to disclose determining a macroblock type as intra or non-intra in the claimed manner. In particular, Panusophone discloses that while it is undesirable, it is nevertheless possible to obtain a new motion vector by averaging four motion vectors.

(Col. 17, ll. 64-66). Significantly, however, such a calculation is performed based on and obtains motion vector information, and not macroblock type information. Moreover, the calculation is a straight average and not a "*weighted mean rounded value*" as claimed.

As further discussed during the interview, the other calculations disclosed in Panusophone are similarly deficient in this regard. For example, Panusophone discloses that where macroblocks all have the same mode, various types of errors may be remedied by: (i) downscaling motion vectors (Col. 19, ll. 16-23); (ii) combining and averaging eight motion vectors (Col. 19, ll. 28-39); (iii) averaging luma motion vectors (Col. 19, ll. 40-47); (iv) applying Dugad's method to luma and chroma DCT blocks by a factor of two (Col. 19, ll. 48-54); or (v) downscaling fields of DCT blocks by using the Dugad and Tim methods (Col. 19, ln. 55 to Col. 20, ln. 64). If all macroblocks are not in the same mode, then a combination of (i) and (ii) above are applied to the motion vectors. Accordingly, Panusophone discloses various calculations which are applied to obtain: (i) a new motion vector; or (ii) a downscaled set of DCT blocks; however, Panusophone fails to teach any calculation which obtains a macroblock type based on a type flag of each macroblock mapping to the macroblock in the new video, as claimed in combination with the other recited claim elements. Moreover, while various average calculations are disclosed, Panusophone fails to disclose any calculation which uses a *weighted mean rounded value*, as claimed.

The Christopoulos reference is also deficient of such a teaching. In particular, while Christopoulos passing macroblock type information when resolution is reduced, it also fails to teach or suggest determining a macroblock type in the claimed manner. For example, Christopoulos disclose that macroblocks may be coded as inter, skip, or intra macroblocks. (¶ 51). For various combinations of the four macroblocks, Christopoulos discloses a three-step logic process for determining how to code a resulting macroblock. (¶ 51). In particular, Christopoulos logic that determines the type of macroblock according to the following steps:

- (1) If any of a 16x16 set of original macroblock is intra-coded, then set the macroblock to "intra";
- (2) If all of the set of original macroblocks are coded as skipped, then set the macroblock to "skipped";
- (3) If none of the set of original macroblocks are intra-coded, and at least one is inter-coded, then set the macroblock to "inter" unless after quantization, all coefficients are set to zero (then set to "skipped").

Accordingly, Christopoulos discloses a logic flow for obtaining a code type for a macroblock, but fails to disclose a method for determining a macroblock type for each macroblock in the video stream in the manner recited. In particular, Christopoulos sets the macroblock type based on whether any one or all

of a set of 16x16 macroblocks is coded to a particular type, rather than by applying a "weighted mean rounded value" determined from the flags of the macroblocks of the incoming video stream. This is particularly so when the above claims (e.g., claim 1) recite, in combination with the other claim elements, that *only* the macroblocks of the incoming video stream that map to the particular macroblock are considered (Christopoulos illustrates that 4 macroblocks map to a new macroblock, but that a 16x16 set of macroblocks is considered (¶ 51; Fig. 8)). Moreover, Christopoulos appears apply only whole macroblocks to a new macroblock, and fails to disclose wherein at least one macroblock of the incoming video stream maps to a plurality of macroblocks of the new video stream (claims 5, 23 and 42) such that a macroblock only partially maps to any one macroblock of a new video stream and contributes only a partial portion of its type flag to the weighted mean rounded value (claim 42).

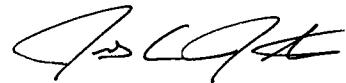
Accordingly, Applicant respectfully submits that the cited references fail to teach or suggest each and every limitation of the present invention, including any use of a "weighted mean rounded value", let alone use of such a to determine the macroblock type of a new macroblock, as claimed in combination with the other recited claim elements.

In view of the foregoing, Applicant respectfully submits that the other rejections to the claims are now moot and do not, therefore, need to be addressed individually at this time. It will be appreciated, however, that this should not be construed as Applicant acquiescing to any of the purported teachings or assertions made in the last action regarding the cited art or the pending application, including any official notice. Instead, Applicant reserves the right to challenge any of the purported teachings or assertions made in the last action at any appropriate time in the future, should the need arise. Furthermore, to the extent that the Examiner has relied on any Official Notice, explicitly or implicitly, Applicant specifically requests that the Examiner provide references supporting the teachings officially noticed, as well as the required motivation or suggestion to combine the relied upon notice with the other art of record.

In the event that the Examiner finds remaining impediment to a prompt allowance of this application that may be clarified through a telephone interview, the Examiner is requested to contact the undersigned attorney.

Dated this 25<sup>th</sup> day of October, 2006.

Respectfully submitted,



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